Space Weather Forecast

Issued on Saturday, 21 October 2023 at 13:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Weak Coronal Mass Ejection arrivals possible, with a chance of G1/Minor Storm intervals on Day 1 (21 Oct).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Low with isolated Common-class flares. Six sunspot regions feature on the visible solar disc, and these are relatively small and simple, with a region in the northwest showing some minor development. No Earth directed Coronal Mass Ejections (CMEs) have been observed during the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind shows has been subjected to minor enhancement in the past 24 hours, probably a result of a glancing CME influence starting around 20/1230 UTC. The solar speed is at Low levels throughout and is now around 310 km/s. The Interplanetary Magnetic Field was weak at first, then soon reaching moderate levels from around 20/1230 UTC. The north-south component was weakly variable, but gradually became moderately southward directed from 20/1610 UTC. Geomagnetic activity was Quiet to Unsettled, before becoming Active to minor storm after 21/0000 UTC.

Energetic Particles / Solar Radiation: No solar radiation storms were observed, with energetic particles at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Low solar activity is likely to continue. There is a slight chance of Moderate-class flares, more so later in the period if we see new regions rotating onto the visible side of the solar disc.

Solar Wind / Geomagnetic Activity: The geomagnetic forecast is complex and carries high uncertainty. There remains two probable Earth directed CMEs. The first is expected to largely miss, but with the potential for a glancing impact in coming hours. The second CME also has a slight chance of glancing impacts shortly afterwards. There is potential for some minor coronal hole fast wind enhancement on Day 1 and again on Day 3 into Day 4 (23-24 Oct). Geomagnetic activity starting at Unsettled to Active levels and a continuing likelihood for Minor Storm intervals. Activity then probably return to mainly Quiet conditions from Day 2 (22 Oct). Unsettled to Active intervals are then possible with the arrival of the anticipated minor coronal hole fast wind later in the forecast period.

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	60	20	10	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	5	5	5	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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